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RYEGRASSES FOR SOUTHERN CALIFORNIA FUEL-BREAKS

By George C. Edmunson[1/] and Donald R. Cornelius[2/]

Fuel-breaks in southern California are wide strips cleared of heavy brush to break extensive brushfields into manageable units. The breaks also provide open areas from which men can safely and effectively fight fires. Permanent revegetation of these cleared areas with a cover of light fuel is necessary to protect the soil. Perennial grasses are best for this purpose where they are adopted, but annuals such as ryegrass have a place on some areas. Commercial annual ryegrass(Lolium multiflorum), often seeded in the past on burned areas to provide temporary cover while brush is growing, does not provide a suitable permanent cover under southern California conditions. Several other strains of annual ryegrass have been studied for character of growth and persistence. This report describes the results of the first two years of study.

METHODS

Six strains of Lolium multiflorum, five of L. rigidum, and one of L. subulatum were broadcast after burning or bulldozing at two locations in the 1958-59 planting season and at one location in 1959-60. The ryegrass strains tested were:

1/ Research Forester, Forest Fire Research, FUEL-BREAK Project, Glendora, California, Pacific Southwest Forest and Range Experiment Station, U. S. Forest Service.

2/ Range Conservationist (Research), Crops Research Division, U.S. Department of Agriculture, Agricultural Research Service.

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Common name	Scientific name	Identification no.
Stonerville #1 rust resistant	Lolium multiflorum	F.C. 34242
Stonerville #2 rust resistant	Lolium multiflorum	F.C. 34241
La Estranzuela	Lolium multiflorum	F.C. 33486
Gulf ryegrass	Lolium multiflorum	F.C. 34002
Florida rust resistant	Lolium multiflorum	F.C. 34225
Commercial annual ryegrass	Lolium multiflorum	F.C. 33915
Wimmera (Pleasanton Source)	L. subulatum	P-11419
Wimmera (Australian Source)	L. rigidum	P.I. 250803
Wimmera (Australian Source)	L. rigidum	P.I. 250804
Wimmera (Australian Source)	L. rigidum	P.I. 250805
Wimmera (Australian Source)	L. rigidum	P.I. 250806
Wimmera (Australian Source)	L. rigidum	P.I. 250807

The locations were similar in elevation and average annual rainfall:

Location	Season planted	Elevation (Feet)	Average annual rainfall (Inches)	Aspect	Seedbed
Paradise (Angeles N.F.)	1958-59	2,850	21	Northerly	Bulldoze
El Cariso (Cleveland N.F.)	1958-59	3,300	23	Easterly	Burned
Mt. Lukens Truck Trail (Angeles N.F.)	1959-60	3,200	28	Northerly	Burned

In both seasons the rainfall was about one-half the longtime average.

FIRST-YEAR PERFORMANCE

Good stands developed at the Paradise and Lukens Truck Trail plots; but poor stands at El Cariso owing to low rainfall after seeding. The Wimmera and Florida rust-resistant strains matured more than 2 weeks before commercial annual ryegrass. The stages of seed stalk development on May 8 indicate the relative times of maturity in 1959:

Strain	Growth stage
Stonerville #1 rust resistant	Seedstalks 1/8 out of boot
Stonerville #2 rust resistant	Seedstalks 1/4 out of boot
La Estranzuela	Seedstalks 1/2 out of boot
Gulf ryegrass	Seedstalks 1/2 out of boot
Florida rust resistant	Headed, not flowering
Commercial annual ryegrass	Very few out of boot

Strain, continued	Growth stage, continued
Wimmera P-11419	Flowering
Wimmera P.I. 250803	Flowering
Wimmera P.I. 250804	Flowering
Wimmera P.I. 250805	Flowering
Wimmera P.I. 250806	Flowering
Wimmera P.I. 250807	Flowering

The relative growths of four ryegrasses on this date are shown in figure 1. The mature seeds of annual ryegrass were noticeably smaller than those of the Wimmera strains. The difference was at least partially due to late seed development during hot, dry weather.

The strains also differed in growth form. All strains of L. multiflorum were taller and grew more upright than the Wimmera strains. Because of a sprawling growth habit and lodging, Pleasanton Wimmera covered 80 percent of the soil surface at maturity at the Lukens Truck Trail Plots. Commercial annual ryegrass covered only 50 percent (fig. 3).

SECOND YEAR PERFORMANCES

At the Paradise and El Cariso plots all the strains formed thicker stands the second year. At Paradise, growth among strains differed considerably from the first year. Commercial ryegrass had considerably shorter culms, smaller seed, and much less vigor than the Wimmera strains (fig. 2). At El Cariso plant vigor was about the same as the first year. Again the seed of commercial ryegrass was small.

Dates of maturity were only generally ascertained but appeared similar to those of the first year. All of the Wimmera strains and Florida rust-resistant strains matured early. Commerical annual ryegrass grew late into the growing season.

Growth habits the second year were similar to those of the first year, and again commercial ryegrass grew upright compared to the sprawling growth form of Pleasanton Wimmera.

SUMMARY AND CONCLUSIONS

1. Five strains of Wimmera and Florida rust-resistant ryegrass matured earlier than all other strains. Commercial annual ryegrass matured latest, at the start of the hot, dry summer.

2. The strains of commercial annual, and to a lesser degree Florida rust-resistant ryegrass, declined noticeably in vigor the second year at the Paradise plots. The Wimmera strains showed little deterioration.

Figure 1.--Development of four annual ryegrasses May 8, 1959. Left to right: Commercial, 6 inches high; Florida rust resistant, 16 inches high; Australian Wimmera (F.C. 250803), 14 inches high; and Pleasanton Wimmera (P. 11419), 15 inches high.

Figure 2.--Pleasanton Wimmera (P-11419) in the second year at the Paradise plots, right, was more vigorous than Florida rust resistant (F.C. 34225), left, and far more vigorous than commercial annual ryegrass (F.C. 33915), center, June 21, 1960.

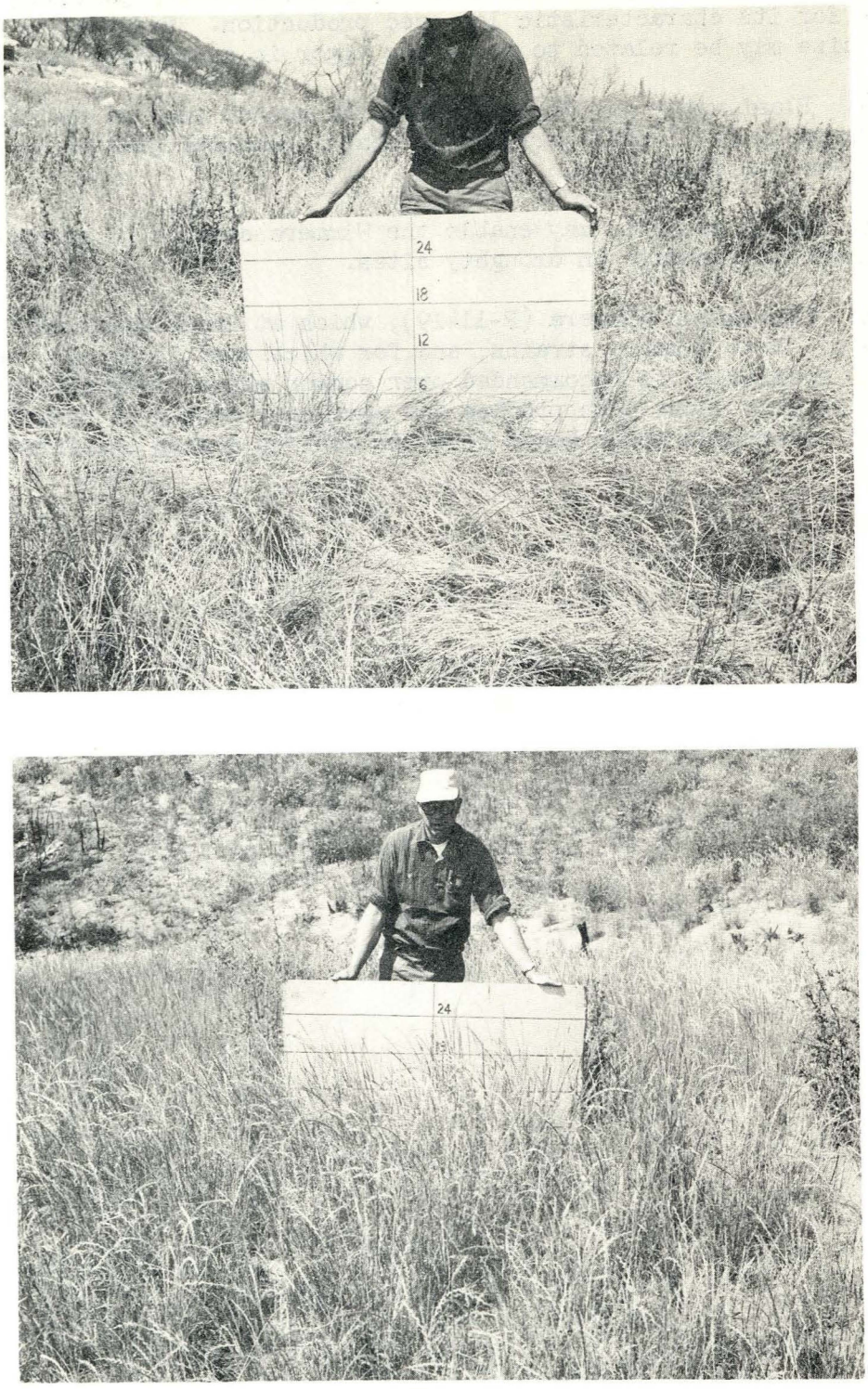

Figure 3.--Pleasanton Wimmera (top) covered 80 percent of the ground surface on the Lukens Truck Trail Plots while commercial annual ryegrass (bottom) provided only 50 percent cover, July 1960.

3. Late maturity of commercial ryegrass probably partially accounts for its characteristic low seed production. Progressive decline in seed size may be related to declining vigor in succeeding years.

4. Plant vigor was about as good the second year as the first at the El Cariso plots. Soil fertility probably remained good owing to poor plant growth the first year.

5. Early maturity may enable the Wimmera strains to persist longer than commercial ryegrass on droughty sites.

6. Pleasanton Wimmera (P-11419), which at least equalled the performance of other Wimmera strains, and for which seed is locally and commercially available, is recommended over common annual ryegrass for fuelbreaks. It also shows much promise for emergency sowing of burned-over chaparral watersheds where dense cover is desired during the first few years.